# EXHIBIT B
# Part 3

Chairman TOM DAVIS. Mr. Garnick.

## STATEMENT OF RICHARD S. GARNICK

Mr. GARNICK. Thank you very much, Mr. Davis and members of the committee. Thank you very much for holding this important hearing. I applaud you and your committee for your leadership in the area of concern of American business and family.

The United States economic competitiveness and technology in the years ahead is at stake. I am president of Keane, Inc., a Boston-based information technology and business process servicing organization.

As to my performance in the context of my comments, I would like you to know that prior to joining Keane late last year, I spent 4-plus years as a senior executive for one of the leading IT services firms based in India, serving as the only American on the management board of any major Indian IT services firms. Thus, I think I have a unique perspective of the global landscape and the competitive threat to U.S. providers.

Many of the comments of the World is Flat I have lived over the last decade. I am also here today in another capacity, and that is as a board member of the Information Technology Association [ITAA], which represents over 325 member companies in the information technology industry.

These are the companies that are the enablers of the information technology economy that Dr. Ruiz spoke about. These range from startups to some of the largest corporations in North America, and they serve companies on a truly global basis. We are united by our concern that if the United States is to remain at the forefront of global high tech economy, we must take practical, prudent steps to preserve our competitiveness today and tomorrow.

I would like to begin my remarks by stating that I truly believe the way forward is clear. Without disciplined, purposeful action, the Nation's high tech future and therefore its economic future is at risk. To remain globally competitive, America must at least double the number of science, technology, engineering and math—or I will use the term "STEM"—graduates over the next 10 years, from approximately current levels of 430,000 to 860,000. If we don't create a more equitable platform for global competition and a larger, better equipped technology workforce, we will surely lose much of the economic edge we have enjoyed for the past 50 years.

Consider, global environments where global collaboration enabled by powerful high speed networks level the traditional barriers to domain expertise and professional interaction. A burgeoning appetite for white collar employment pits country against country in a race to perform services in competitive bidding heretofore unimaginable, target national investments in science education, develop a large cadre of STEM workers to pursue those global opportunities and in the process rewrite the rules of global economic engagement.

The big question in front of us is can a high standard of living country like the United States compete in this transformed business environment? Unequivocally in my opinion, the answer is yes. But innovation and creative scientific engineering and technical disciplines may be the last line of defense against an otherwise uncomfortable future.

In the past, scientific discovery could yield practical knowledge in commercial products capable of sustaining an entire community for years. Scientific innovation has produced roughly half of all U.S. economic growth in the last 50 years. Foreign suppliers certainly contributed to the value chain during this time, but they did not supplant it.

The road to the future, STEM. In the early days of the Republic, the Nation's manifest destiny lay on the trails and canals running West. Pioneers used these difficult avenues to pursue a still more difficult American dream of individual freedom and national strength. Today and into the foreseeable future, the road to global competitiveness, and therefore America's destiny, runs through education and the STEM fields. We fundamentally need more trailblazers from our entire diversified community of Americans, and they will be needed because the more we have, the more trails we can blaze.

The power of computers, software communication is enormous today, but will be dwarfed by computational resources available to typical users 10 years from now, again due to the thanks of the semiconductor industry and all the providers of technology platforms like Dr. Ruiz's company. This computational power sets the stage for enormous discoveries in virtually all aspects of human endeavor, ranging from preventing diseases to modeling behavior of markets. Advances in technologies like data mining, data storage, high speed networks, etc., will launch a new information revolution and endow these societies able to harness this power with global economic leadership.

STEM graduates will channel this force and allow the United States to realize its fullest potential. As Brian spoke about earlier, he lowered his number of total workforce but increased the high quality of his workforce and improved productivity of his business. But there are warning signs out there. U.S. self-sufficiency in math and science is at issue.

We spoke about it through earlier sessions, but American universities granted 50 percent of the doctorate degrees in computer science to foreign born students working in industry. The percentage of doctoral degrees in engineering is even higher; 22 percent of our science and engineering jobs in the United States are now held by the foreign born. While the Nation may be able to meet short-term labor shortages by relying on this talent pool, such workers may ultimately decide to repatriate, taking with them their advanced degrees and American industry experience.

The number of undergraduate degrees awarded to science and engineering students is falling. Between 1985 and 2000, bachelor degrees awarded to engineering and math and computer science, etc., had fallen by 18.6 percent. Roughly one-third of the students declaring an engineering major switch prior to graduation. The number of newly declared computer science undergraduates has dropped 33 percent, and computer science master's degree candidates have declined 25 percent since only 2002.

In addition, tighter customs and immigration controls in response to homeland security concerns are dissuading foreign students from study in the United States. A 2004 survey by the Council of Graduate Schools found that a number of foreign students in

U.S. science and engineering programs is down 24 percent in terms of the former and 20 percent in terms of the latter. Moreover, foreign students who are electing to study hard science disciplines may face a harder time with visa screenings and the entire processes.

So this brings us to the question: How do we sharpen America's competitiveness and edge in the 21st century? From my perspective, it means that we need to begin by focusing on three things: Education, government policies and industry efforts in partnership.

Education. The STEM workforce. The key is expanding this. Again, we have to at a minimum double the workforce over the next 10 years. This seemingly monumental goal will still put us at a competitive disadvantage in the way of pure numbers to the STEM workers in India, where I spend so much time, China, where I spend a lot of time, as we continue to lose ground due to demographics and emphasis of their overall economy.

In 2004, the Academy of Natural Sciences reported that 350,000 students from China graduated with bachelor of science degrees, compared to only 140,000 in the United States.

Last, India is graduating over 300,000 engineers in 1 year alone and that is expected to continue to grow to over half a million. And that compares to our graduating of less than 75,000 engineers a year.

Competition is a numbers game, and at a minimum doubling the number of STEM graduates is necessary to best position the United States for economic prosperity.

Government policies. How can the government step up and lead? You can help by helping facilitate the doubling of the STEM workforce. Doubling this will pull adequate student enrollments from groups that are currently underrepresented in the math and science professions. We have a major disconnect. Women are one dramatically underrepresented group. The percent of women in the IT workforce declined from a high of 41 percent in 1996 to 32.4 percent in 2004, while the total number of women getting college degrees has grown.

Just 3 percent of 12th grade African Americans and 4 percent of Hispanic Americans are proficient in science, a situation that doubtlessly limits the number of minority students in the STEM college programs and the STEM workforce over all.

The actions I have described today will play out over many years. There are, however, practical steps that can be taken in the near term to hone the Nation's competitive advantage. One such step is in the area of increased access to foreign born talent.

Congress should move to make the current limits on business, immigration programs reflect real world conditions. In the real world, the 65,000 visa cap placed on the issuance of H1B visas in 2006 was reached 2 months prior to the start of the fiscal year.

Other important policy steps to double the number of STEM graduates: Extending training and assistance to workers in services industries, to workers when they are displaced through other means of economic transformation, controlling health care costs. In addition, there are other fundamental policies that need to be evaluated, policies that support free but fair trade. We need economic policies that support an equitable platform for stimulating investment for enterprises.

Companies out of India, software services companies, pay zero taxes on revenues and profits for the services that they render. That creates a disequilibrium in their ability to invest back into their businesses.

Our industry is a national agenda item for many countries or regions of the world, including China, India, Eastern Europe, South America, just to name a few, because our industry is truly transforming their economies.

I would like to correct the record earlier today. One of the Congressmen spoke about the Henry Ford principle. One of the things that our industry is doing in India is creating a stronger middle class that is creating potential markets for free trade, so Dr. Ruiz can sell chips to the PC manufacturers that sell PCs to companies like I that put them on the desktops for companies and the employees that are over in India and for the computers that they build on their own. However, there is a competitive disadvantage due to some tax burdens and other factors that the government has put in place.

Industry. What role do we have? In addition to the action by government, the industry can play a role through community involvement, scholarships, mentorships, internships. The STEM workforce will grow only to the extent that young people see a future in career opportunities. U.S. high tech companies must help the newcomers see the potential of careers, interesting work and interesting opportunities.

One of the things I have done since joining Keane is we are going to be initiating programs to ensure that we attract the best talents and give opportunities to the best and brightest out of colleges and universities here in North America. We are investing programs to recruit and train college graduates for positions throughout North America and help in the next generation of managing teams globally, and truly making global work work.

So in conclusion, true leadership requires reasoned responses to present evidence. Despite its many comparative advantages—a democratic tradition, a system of laws, access to education for all, protections for intellectual property and a culture which nurtures and rewards entrepreneurship—the United States has entered an era of unprecedented global competition. At the same time American students are turning away from math and science programs that would equip them to compete for the future.

The Nation's best response to the new competitive reality posed by these nations is to apply American ingenuity and innovation across the spectrum of human endeavor. As a businessman who has been involved deeply in the international high tech marketplace, I can tell you that the global race has not only started but that countries, including China and India, are pulling ahead in many areas. They are making the investment in education. They are producing world class research and development, and they have the will to win. And so must we.

I would like to thank the committee for this opportunity and I look forward to working with you on legislative proposals to eliminate our disparities in education and workforce development.

Chairman TOM DAVIS. Thank you very much.

[The prepared statement of Mr. Garnick follows:]

# STATEMENT OF RICHARD S. GARNICK, PRESIDENT, NORTH AMERICAN SERVICES FOR KEANE, INC. TESTIMONY BEFORE THE HOUSE GOVERNMENT REFORM COMMITTEE

February 9, 2006

Chairman Davis, Ranking Member Waxman, and Members of the Government Reform Committee: Good morning and thank you for holding this hearing on "Sharpening Our Edge – Staying Competitive in the 21st Century Marketplace."

I applaud you and the Committee for your leadership in an area of concern to every American business and family: The United States economic competitiveness and vitality in the years ahead. I am Richard Garnick, president of North American Services for Keane, Inc.

Keane is a leading business process and Information Technology (IT) services firm. We deliver Application and Business Process Services to help clients transform their business and IT operations to achieve demonstrable, measurable, and sustainable business benefit. As a trusted advisor and partner for its clients, we solve real business issues through the development and implementation of cost-effective, change-oriented and industry-specific solutions.

We believe that business and IT improvements are best realized by streamlining and optimizing business and IT processes, implementing rigorous management disciplines, and fostering a culture of accountability through meaningful performance metrics. We deliver our services through an integrated network of regional offices in the United States, Australia, Canada, India, and the United Kingdom, and are via SEI CMMI Level 5 evaluated Advanced Development Centers (ADCs) in Canada and India.

**Summary**

Sharpening America's competitive edge in the 21st Century simply means expanding the US Science, Technology, Engineering and Math (STEM) workforce. To remain globally competitive, America must double the number of STEM graduates over the next ten years, from approximately 430,000[1] to 860,000. In 2004, the National Academy of Sciences reported that 350,000 students from China graduated with Bachelor of Science degrees compared to 140,000 US students. In addition, 290,000 students graduated with three-year degrees from China compared to 85,000 US students with two-year degrees. Without disciplined, purposeful action, the nation's high tech future, and therefore its economic future, are at risk.

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[1] Science and Engineering Indicators 2004, National Science Foundation

Workforce development is an imprecise undertaking at best. Although short-term labor surpluses in select areas can foster a desire to find the next vein of "hot jobs" in the economy, mapping today's education and training regimes to future job availability can be a confusing and frustrating process. Competition is a numbers game and doubling the number of STEM graduates is necessary to best position the United States for economic prosperity going forward.

**Warning Signs are Evident**

Competition for the future begins with competition in the classroom. If present day trends continue, America's ability to produce industry-defining innovations will dissipate and its role on the global economic stage could be reduced substantially. Warning signs are evident:

- Demographics are moving in the wrong direction. The college age population in many developed countries is declining, shrinking the pool of potential STEM graduates. Over 50 percent of STEM, degree holders are older than 40 years of age, making shortages in the next 20 years all but certain.[2]

- US self-sufficiency in math and science is at issue. American universities grant 50 percent of doctoral degrees in computer science to foreign-born students working in industry. The percentage of doctoral degrees in engineering is even higher.[3] 22 percent of science and engineering jobs in the US are now held by the foreign born.[4] While the nation may be able to meet short-term labor shortages by relying on this talent pool, such workers may ultimately decide to repatriate — taking with them their advanced degrees and American industry expertise.

- Tighter customs and immigration controls in response to homeland security concerns are dissuading foreign students from study in the US. A 2004 survey by the Council of Graduate Schools found the number of foreign students in US science and engineering programs is down, 24 percent in terms of the former and 20 percent in terms of the latter. Moreover, foreign students electing to study "hard" science disciplines may face a harder time in the visa screening process.[5]

- Federal government support for research and development has slipped substantially. In the aftermath of the Soviet Union's Sputnik launch, federal R&D funding of basic research swelled to 75 percent of all such spending. Seventy cents of every R&D dollar now comes from the private sector.[6] Federal R&D spending creates jobs for STEM graduates directly. This support also underwrites the development of valuable intellectual property that, through a process of technology transfer from the public domain to the private sector, forms the basis of still more capital investment, job creation, and wealth creation.

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[2] National Science Board, The Science and Engineering Workforce, Realizing America's Potential, page 7
[3] Ibid, page 8
[4] Ibid, page 9
[5] Mary Beth Marklein, "Fewer Foreigners Enrolling in Grad School," *USA Today*, September 7, 2004
[6] John A. Douglass, R&D and the U.S. Economy: A Sputnik Reflection, University of California, Berkeley

- While the number of undergraduate degrees awarded in the US is rising, the number of degrees awarded to science and engineering students is falling. Between 1985 and 2000, bachelor's degrees awarded in engineering, math, computer sciences, physical sciences and geological sciences fell 18.6 percent.[7] Roughly one-third of students declaring an engineering major switch prior to graduation.[8] The number of newly declared computer science undergraduates has dropped 33 percent and computer science masters' degree candidates have declined 25 percent since 2002.[9]

**Turning Around, Stepping Up: Why Government Must Lead**

Doubling the size of the STEM workforce is a challenge for STEM-focused and STEM-reliant industries. However, this is not a challenge for industries alone. Placing intelligent wagers on the nation's economic future must bring all players to the table, including government and, by extension, taxpayers. Fostering the type of workforce capable of accelerating invention and innovation across STEM competencies requires both a long-term view, and a broad view.

Businesses confronting the pressure to produce quarterly profits for shareholders are not ideally suited to the job of promoting STEM education and ultimately doubling STEM undergraduate enrollments. Failure is a potential outcome for all attempts to expand scientific knowledge, create inventions, or commercialize results. By its nature, businesses seek low risk, incremental product improvements and not transformational changes through high-risk research and development. Even corporations with a strong commitment to in-house research tend to downplay or spin off inventions not considered central to enterprise business strategies.

Innovation as a national economic strategy is a path marked by many hurdles. Only government can make the type of wide-scope investments in the STEM people, processes and applications required to assure the U.S. economic competitive leadership in the years ahead. Government as steward for the American people stands to benefit from the unpredictable, but economically powerful spillover effect of broad- gauged research and development investments. In addition, government benefits from STEM investments as knowledge transfers from the public to the private sector, generating business growth, job growth, and, as a result, tax revenue growth.

Comparative advantage in many high paying white-collar occupations is being erased rapidly. US supremacy in many high technology domains is eroding. If the surest path to economic growth is an accelerated cycle of basic research, invention, innovation, and technology transfer, then government, industry and academia must work together to identify priorities and shoulder appropriate responsibilities.

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[7]Ibid, page 16

[8] Rising Above the Gathering Storm, National Academy of Science citing Myles Boylan, 2004, "Assessing Changes in Student Interest in Engineering Careers Over the Last Decade," National Academy of Engineering

[9] Computer Research Association, Taulbee Survey, 2004.

**Roles for Industry**

The STEM workforce will grow only to the extent that young people see future career opportunities. US high tech companies must help newcomers understand the potential of such careers, the background requirements and experience needed to obtain this work and offer programs that assist students in gaining meaningful work experiences.

For example, Keane has initiated programs to ensure that the best and brightest college graduates are offered rewarding career opportunities in the US. We are investing in programs that recruit and train college graduates for positions throughout our North American Operations – from consulting engineers to technical sales consultants.

We are working with colleges at the earliest stages of career development to create internships and co-op programs that expose promising young engineering and business students to career opportunities at Keane. These programs target academic records of accomplishments that represent the intersection of business and technology and are designed to foster and reward the continued pursuit of innovation in these areas. We believe these efforts are important first investments in the future of Keane and the United States.

Corporations must play a role in public private partnerships at the national, regional, and local level. Quite often, this means funding fellowships and research, providing opportunities for student mentorship and internship programs and job shadowing, creating summer employment assignments for teachers, and participating in "adopt a school" programs. Industry engagement can also mean interaction and leadership on workforce investment boards, support of community colleges, and outreach to one-stop employment centers.

Many high tech corporations have adopted global delivery models, an approach that allows these enterprises to source expertise regardless of location and accelerate the pace of technology development. These factors may enter into a decision to seek skills and source jobs on a global rather than domestic basis. Clearly America cannot expect to be all things to all STEM markets, but industry must help the nation place its best possible bets now and in the future.

**Roles for Government**

It is evident that the government has an overarching responsibility to protect the national interest by investing in the nation's STEM workforce. With a policy commitment in place to double the number of STEM graduates over ten years, the federal government should likewise commit substantial funding to this purpose. We applaud the vision articulated by President Bush in his State of the Union address for an American

Competitiveness Initiative, and we look forward to working with the Bush administration and Congress on these efforts.

As members of Congress, I encourage you to plan a steady increase in Research & Development funding for both the National Science Foundation (NSF) and the National Institutes of Science and Technology for the 2007 Fiscal Year. NSF provides important stimulus to advancing the nation's STEM capabilities. The connection between high-risk basic research and economy lifting innovation is irrefutable, from the work leading to the discovery of lasers to fiber optics, and to the development of nylon and Teflon.

In addition to funding basic research, Government can play an important role in facilitating private sector research by making permanent the Research & Development tax credit. The existing R&D tax credit reduces the cost of capital, thereby mitigating the risks and allows companies to "push the envelope" in their technology development. A more aggressive approach to research in turn yields more bountiful returns to company investors, shareholders, and in the economy as a whole.

The Bush administration should continue to create incentives for the formation of highly useful public-private partnerships. Such partnerships help level set expectations, identify critical knowledge, and assure that STEM skill sets of US workers match the jobs of the 21st century.

Only three percent of 12th grade African American students and four percent of Hispanic American students are proficient in science — a situation that doubtless limits the numbers of minority students in STEM college programs and in the STEM workforce overall.[10] How will you as policymakers increase this percentage so all Americans are competitive tomorrow?

The action I have described today will play out over many years. There are, however, practical steps that can be taken in the near future to hone the nation's competitive advantage. One such step is to double the number of STEM graduates, which will include:

- Extending other training and assistance to workers in the services industries. In particular, the federal government should assist mid-career individuals who, through no fault of their own, have lost jobs in response to market pressures. Encouraging displaced professionals in and out of STEM-related industries to seek grants and other educational assistance in STEM fields will enhance the STEM ranks.

- Controlling health care costs so that employers can afford to keep jobs in this country. Companies and employees should be focused on getting the job done, not keeping a lid on health care expenses. Too often, the rising cost of health care enters into the company's plans for R&D investment, business expansion, and, ultimately, the hiring decision. Health care should be an affordable employment

[10] National Assessment of Educational Progress, 2000

benefit, not a major factor in a company's strategic staffing calculations. Health care costs are especially important for companies wherein competitiveness equates to intellectual capital and human asset availability.

- Nurturing the cross-pollination of technology and entrepreneurial education. A focus on entrepreneurial education for STEM students bridges the gap between theory and practice, draws more students to STEM programs, increases the likelihood that individuals starting in STEM disciplines will remain in STEM careers, and accelerates the economy's push for greater growth through innovation.[11]

Our elementary and secondary educational system must equip students to pursue STEM-related undergraduate and graduate degrees. Studies show that six out of ten high school students advance to Algebra II, and only one in ten high school students advances to trigonometry or calculus.[12] While retraining is always a possibility, students without inadequate foundation in math and science fail to qualify for opportunities as we look to higher-level education in STEM areas and STEM jobs down the road.

**Conclusion**

As a businessman who has been involved in the international high tech marketplace — most importantly, as a member of the Information Technology Association of America IT Services Board of Directors, I can tell you that the global race has not only started, but that countries including China and India are pulling ahead. They are making the investment in education. They are producing world-class research and development. They have the will to win, and so must we.

True leadership requires reasoned responses to present evidence. Despite its many comparative advantages — a democratic tradition, a system of laws, access to education for all, protections for intellectual property, a culture which nurtures and rewards entrepreneurship — the US has entered an era of unprecedented global competition. At the same time, American students are turning away from the math and science programs that will equip them to compete for the future.

The nation's best response to the new competitive reality posed by China, India, and other nations is to do what it does best — apply American ingenuity and innovation across the spectrum of human endeavor.

More than 2600 years ago, the master Kuan Chung said: "If you plan for a year, plant a seed. If for ten years, you plant a tree. If for 100 years, teach the people. When you sow a seed once, you will reap a single harvest. When you teach the people, you will reap a hundred harvests." It is important that Congress must now plant those seeds of education and job training skills in our public school system. China and India have already begun, when will we?

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[11] Ohland et al, "The Effect of an Entrepreneurship Program on GPA and Retention." Journal of Engineering Education, Vol. 93, No. 4, pp. 293-301.
[12] C.B. Cleweel & P.B. Campbell, "Taking Stock: Where We've been, Where We Are, Where We're Going," Journal of Woman and Minorities in Science and Engineering, Volume 8, pp. 255-284, 2002

I would like to thank the Committee for this opportunity. I look forward to working with you on legislative proposals to eliminate our disparities in education and workforce development.

Chairman TOM DAVIS. Ms. Wince-Smith.

STATEMENT OF DEBORAH WINCE-SMITH

Ms. WINCE-SMITH. Chairman Davis and members of the committee, thank you for this opportunity to present testimony on the competitiveness of U.S. businesses and the pivotal role that government can play in supporting America's business success at home and successful competition in a fiercely global economy.

I would like to thank Secretary Gutierrez for his leadership because he truly is a champion of economic competitiveness, as is the Deputy Secretary. They are indeed forceful advocates for the innovation imperative that will drive our productivity and ensure prosperity for all Americans.

I would also like to commend my colleague and friend Dave McCurdy, and he serves on the leadership council of our National Innovation Initiative. But I want to also recall his leadership back as a Congressman when he was one of the sponsors of the 1988 National Super Conductivity Competitiveness Act. And I was working in the Reagan White House at the time. And it was a fabulous example of bipartisan moving forward, which really signals today where we are with the bipartisan legislation, with the Innovate America Act and the new PACE legislation. So really we are at a threshold, or a tipping point, for national awareness, commitment, and bipartisan action.

In the State of the Union address last week, in the President's unveiling of his American Competitiveness Initiative, he really clearly set forth a policy and an investment platform for students, for workers, for entrepreneurs and our global business, and the Council on Competitiveness commends the President and his administration for this groundbreaking initiative.

The Council, by the way, is entering its 20th anniversary, and our CEO, University Presidents and labor leaders are all committed to developing an action agenda to drive competitiveness and productivity. Indeed, it is our enduring mission and the reason we were created by John Young over 20 years ago.

In January, we welcomed our new chairman, Chad Holliday, the president and CEO of DuPont, who succeeded Duane Ackerman, the chairman of BellSouth. And I can't help but mention that from its inception DuPont's business has been innovation driven. And indeed, some of the talk this morning about the transformation in energy renewables, sustainability, moving away from petroleum based products is already underway at DuPont, and we are going to see that really permeate our business in the years ahead.

The National Innovation Initiative is a flagship work of the Council and it is entering its third year and we are very proud. It is led by Craig Barrett, the chairman of Intel and Bill Brody, the president of Johns Hopkins. These are leaders that have taken forward the work that we launched back in 2004 under the leadership of Sam Palmisano of IBM and Wayne Clough of Georgia Tech. But this is an initiative that galvanized over 500 leaders across the country to probe the changing nature of 21st innovation and then construct a policy agenda for America.

Now when it comes to competitiveness, I think Americans tend to veer between complacency and hysteria. On the one hand many

Americans find it hard to conceive of a world where we are not the world innovation leader, but others recognize that our leadership is being challenged by other nations who are taking our model to heart.

Indeed, if current trends continue—and we have heard many of these trends and statistics this morning—our economic prowess and national security will be seriously compromised. The United States is still the global leader and benchmark for competitiveness. As the Secretary described this morning, our economy continues to deliver unprecedented productivity growth while productivity growth in the rest of the world is relatively stagnant. And we have low unemployment and our creativity and entrepreneurship and business models and business innovation is indeed the envy of the world.

Yet we know that the waters we must navigate in the future 21st century that we are in today are not those that propelled us to a safe harbor in the 20th century. The pace of technological change, its rapid deployment across the globe, the emergence of new competitors, fueled by a demand driven economy with powerful consumers in charge, means that the policies of the past cannot be the policies of the future.

Low wage nations around the world are developing high skilled, high performing workforces, investing in their talent, in their R&D and in their infrastructure and creating optimal business climates and tax incentives to indeed propel their innovation. They are hungry for the world's work. And let's accept the reality. Every day it is easier to ship that work around the globe in bits and bytes. Indeed, at the Council we believe and know that if work is routine, rule based, digitized and reliably codified, there will be a source of labor somewhere in the world to compete for that investment and that job. So we cannot compete on standardized services, commodity products, only on innovation.

And let me define innovation, because I think we all talk about it but what is it really? At the Council we say it is 1 to the fifth power. It is the intersection between ideas, imagination, insight, invention and implementation, and it is ultimately about new value creation.

We have to have an innovation ecosystem with a highly skilled, creative and flexible workforce, the investment in the long-term basic research at the frontiers, and this infrastructure of regulations as well as the physical and digital world that enables our people and businesses to harness their knowledge and new ideas and technology to indeed be competitive globally. The recommendations in our NII agenda reflect this, and indeed we look at the whole system as a very dynamic innovation ecosystem.

But we are not stopping still. While we will continue to push on the legislation and the President's initiative, we are already undertaking what we refer to as the over horizon innovation challenges, with new initiatives to propel America into the leadership role in 21st century manufacturing. There is indeed a renaissance in manufacturing. It is in transformation, with the power of desktop fabrication, T to T sensing, the use of supercomputing in design and the power of logistic supply chain control.

We are also focused on how to have the users and the demand side of the energy equation drive our independence and sustainability.

In implementing our NII recommendations, we also are focusing on what is going on in the United States in our regional innovation capacity. Working with the Department of Commerce's Economic Development Agency and the Department of Labor, Secretary Chao rolled out right after the State of the Union a fantastic new initiative called WIRED, regional economic development for workforce innovation, and we believe that this is going to catalyze and trigger across our country the emergence of innovation hotspots consistent with the public-private partnerships that we are talking about today.

And I might say that every week at the Council we are having requests from all over the world to talk about innovation hotspots and why in the United States we really have a lot of the ingredients and road map for that.

But of course the government also has a very, very important role across the continuum of talent investment and infrastructure. The government has to ensure that in the United States we have this optimal, high performing, innovation friendly climate for our enterprises to develop and compete at home and abroad.

And this deals with the whole issues of the balance between risk and reward, our regulatory system to protect our citizens but not hurt our companies. We really need to get the R&D tax credit permanent. It's been on the book for years and years and years. It is kind of time to put that, I think, behind us. And of course the protection of intellectual property, ensuring the rule of law and transparency globally, all of these things the government has a strong responsibility for.

And let me say that with our commitment for STEM education and ensuring that our children have the skills, the analytical capability, and the creativity to go forward, we have to increase this investment in the frontiers of knowledge through NSF, the Office of Science mission, and our DOD world.

But I want us not to forget that we should draw on our culture of creativity. I believe that America is indeed a place that has a mix of creativity that is unsurpassed in the world. And so as one of our members said, we need artists who can think like engineers and engineers who can think like artists.

And finally, let me share with you, it was not—I think it was very powerful that the President mentioned two areas in his speech, nanotechnology and supercomputing. We are leading in nanotechnology. Are we going to capture the value here in the United States or will it be in China and other parts of the world? Our manufacturing prowess depends on that. And clearly supercomputing and enabling that down to the level of our small suppliers and entrepreneurs will give us a huge competitive advantage. And again we are on a renaissance in that world.

Let me conclude by sharing with you a comment from one of our members, Roger Enrico, the former CEO of Pepsi and now the CEO of Dreamworks Animation. He recently talked about the importance of making big changes to big things, and change in progress, he explained, will never come if we don't free ourselves from the tyranny of incrementalism. Dramatic results do not come from undramatic action, and innovation is a race with no beginning and no end. And it is time for all of us to get started and ensure that we create a legacy for our children that takes the power of innovation to the next level.

And I would be happy to answer any questions and look forward to working with this committee.

Chairman TOM DAVIS. Thank you very much.

[The prepared statement of Ms. Wince-Smith follows:]

**Deborah Wince-Smith**
**President, Council on Competitiveness**

**Testimony before the House Government Reform Committee**

**Thursday, February 9, 2006**
**2154 Rayburn House Office Building**

Good morning, I'm Deborah Wince-Smith, the President of the Council on Competitiveness. Thank you, Chairman Davis and the members of the committee, for this opportunity to present testimony on the competitiveness of U.S. businesses and the important role government can play in supporting these businesses. The Council on Competitiveness is a membership organization of CEOs, university presidents and labor leaders committed to developing an action agenda to drive U.S. competitiveness and productivity, so this hearing is of great interest to our organization and, in particular, our chairman, Chad Holliday, President and CEO of DuPont.

One of our members at the Council likes to say that when it comes to competitiveness, Americans tend to veer between complacency and hysteria. On the one hand, many Americans find it hard to conceive of a world where the US is not the global innovation leader. But others point to increasing signs that America's leadership is being challenged in certain areas and could even fall behind if current trends continue. We, as a nation, do not on the cliff's edge as some would argue, but instead at a crossroads. Complacency, a defense of the status quo, leads down a path that could take us to the cliff, but at the very least risks subjecting the United States to a slow erosion of economic leadership and a reduced standard of living for its citizens. Down the other path lies entrepreneurship, risk taking and a national commitment to innovation that can ensure continued economic growth.

**A Strong Foundation**

Given America's still dominant position in the world and our leadership through most of the twentieth century, I suppose a certain amount of complacency is inevitable. And, the good news. Statistics indicate that our glass is more than half full and we have a strong foundation on which to build our future. Let me share a few key metrics.

- The US consumer market is the largest in the world by far. It is more than twice the size of Japan's- the next largest consumer market.
- While developing nations like China are growing much faster than the US, the US economy is still responsible for a larger share global economic growth than any other country. Over the past five years China has grown more than three times as fast as the US. But since the US economy is 8 times larger than the Chinese economy, that cumulative 3% growth over 5 years added $1.7 trillion to our economy (an amount that exceeds the total size of China's economy).

- Total U.S. R&D spending is greater than all of the other G-7 countries combined and accounts for nearly 44% of all R&D spending in the OECD.[1]
- The US holds nearly 40% of the total global financial stock
- US GDP per capita is among the highest in the world (It has doubled since 1970)
- The US has the highest proportion of population in the workforce of any country in the industrialized world and the lowest long-term unemployment rate in the west
- Despite a dramatic drop in 2003, the US remains the top destination for Foreign Direct Investment. China overtook the US in 2003, but the US has bounced back.

So clearly, the US is still a global leader and the benchmark for competitiveness. So it would seem as though the complacent among us would have the upper hand and say, continue to do what we have done and not rock the boat.

**The Challenge**

But all of us in this room know that the waters we must navigate in the future 21st century are not those that propelled us to our safe harbor in the 20th century.

Consider these statistics:

- In 1970 the US enrolled approximately 30% of tertiary level students in the world, and over half of s&e doctorates were granted by US institutions of higher education. In 2001-2002 UNESCO data shows that US enrolled just 14% of tertiary students
- Asia now spends as much on nanotechnology as the United States[2]
- Only six of the world's 25 most competitive Information Technology companies are based in the United States; 14 are based in Asia.[3]
- Federal funding of basic research is now only half of its mid-1960s peak of 2 percent of GDP.
- Total scientific papers by American authors peaked in 1992 and have been flat ever since.[4]

Yes, the US still leads the world in many areas, but our competitors are rapidly moving up in the rankings and, in some cases, have already surpassed us. Other countries are adopting America's innovation-led growth strategy. And they are doing it with more focus and intensity than we are.

As Americans we know that we cannot, nor would we want to, compete on low wages, commodity products, or standardized services but on high value economic activity that commands a premium in fiercely contested global markets. Low wage nations around the world are developing high skilled, high performing workforces. And those nations are hungry for the world's work, and it is easier every day to ship that work around the globe

[1] NSF, Science and Engineering Indicators 2004
[2] Lux Research, *The Nanotech Report 2004*, August 15, 2004. https://www.global salespartners.com/lux/.
[3] *BusinessWeek*, "The Information Technology 100 Scoreboard," June 21, 2004. http://www.businessweek.com/pdfs/2004/0425_it100.pdf.
[4] NSF, *Science and Engineering Indicators*, 2004. http://www.nsf.gov/sbe/srs/ seind04/c5/c5s3.htm#p1.

in bits and bytes. At the Council we say, if work is routine, rule-based, if it can be digitized, and reliably codified, there's going to be a low cost source of labor somewhere in the world to compete for that work and for those jobs.

So the global playing field is leveling and it's becoming clear that we are going to have to work a lot harder to stay ahead in an interconnected global economy. But just when we find it essential to invest in our innovation capacity, we see our ability to invest threatened by our growing triple deficit—in the federal budget, in the current trade balance and in personal savings.

- Between fiscal year 2001 and fiscal year 2004, the federal budget went from a surplus of $127 billion to a deficit of $412 billion.[5]
- And unfunded liabilities like Social Security and Medicare threaten to take up an increasing share of the budget.
- Our trade deficit in 2004 was $617.7 billion, the highest on record. As a percentage of GDP, it increased from 4.5 percent in 2003 to 5.3 percent in 2004.[6]
- The U.S. has the lowest savings rate among developed countries.
- We are now relying on foreign governments—especially China and Japan—to finance our deficit.

Former Chairman of the Federal Reserve Alan Greenspan called these deficits untenable. Together these trends will make it increasingly difficult for us to find domestic sources to fund innovation and to remain the preeminent place to attract high value investment and perform high value economic activity.

**The Role of Innovation**

Innovation is the key to meeting these challenges.

Building upon the Council's long standing focus on innovative capacity as the productivity driver for U.S. prosperity, we brought together over 500 of the country's most talented thinkers and leaders to ponder the changing nature of innovation, the evolution of the global economy, and, most importantly, what the US needs to do to remain the world leader in innovation. They developed an action-agenda that calls on all sectors of society to work together to solve the great challenges of our day.

Why focus on innovation? Well, our members—CEOs from across industrial sectors, university presidents and labor leaders—firmly believe that innovation will be the single most important factor in determining America's success through the 21st century.

The Council's National Innovation Initiative defines innovation as the intersection between ideas, imagination, insight, invention and implementation. We call it, "I" to the fifth power. Fundamentally, it is about the creation of new value. And the Council's long-standing policy research has demonstrated that innovation has been the principal driver of U.S. GDP and productivity growth and a rising standard of living for the past 50 years. More specifically, studies show that total factor productivity—generally attributed to innovation—was responsible for 47% of U.S. economic growth between 2000 and 2004.[7]

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[5] Global Insight
[6] U.S. Census Bureau, Feb. 10, 2005 (http://www.census.gov/indicator/www/ustrade.html)

But, let me emphasize—for this is crucial to building the public institutions to support new policies and new behaviors—innovation is more than just a driver of economic growth. Innovation has always been the way people solved the great challenges facing society. Today, innovations not yet imagined may enable us to achieve dramatically higher levels of health across the planet; feed vast populations with the protein-based diets essential to health; meet the challenge of a rapidly aging population; find plentiful, affordable, environmentally-friendly sources of energy; and, continually push the frontier of exploration. And innovation will lead to the solution of problems that do not even exist yet and to the opening of new vistas of undreamt of opportunities for ourselves and for future generations.

Innovation has changed tremendously from the days of large industrial research laboratories and ivory tower universities. Where, how and why innovation occurs are in flux – across geography and industries, in speed and scope of impact, and even in terms of who is innovating. We see this transformation in a number of areas.

- The pace of innovation is increasing. For example: while it took 55 years for a quarter of the country to get an automobile, 35 years for the telephone, and 22 years for the radio, it has only taken 16 years for the PC, 13 years for the cell phone and just 7 years for the Internet to penetrate a quarter of the U.S. population (and those trends are just as quick in other countries).
- Innovation has become multidisciplinary. It arises from the intersections of different fields or spheres of activity.
- At the same time, it is collaborative – requiring active cooperation and communication across organizations, companies, regions and countries. "Co-creation" is the new buzzword.
- Consumers are now in charge as we have moved from a production-driven world to one in which discerning customers are in charge with choice and power.
- And it is rapidly becoming global in scope – with advances coming from centers of excellence around the world.
- Manufacturing and services are merging
    - The sharp dividing line between manufacturing and services is increasingly blurred.
    - Manufacturing companies are transforming themselves from product suppliers into solutions providers—melding services seamlessly into product lines.
    - When they blend like this we're actually creating whole new markets and market opportunities.

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[7] Global Insight

At the same time that innovation has become a global enterprise, the world economy has globalized and integrated at a pace few predicted even 10 years ago. In less than 20 years, many nations have at last embraced market economies and moved toward political democratic norms. And this is a fantastic metric of success for world stability and quality of life. It also means that countries can now compete on traditional cost and quality terms, but they know that it is innovation—the ability to create new value—that will confer a competitive advantage in the 21st century. The playing field is leveling, and the barriers to innovation are falling.

My core message is that America's long-standing lead in innovation and entrepreneurship is by no means assured. We must create an environment in which innovation can flourish and transformational value can be achieved.

**The National Innovation Initiative**

This challenge is why the Council launched the National Innovation Initiative. Co-chaired by Sam Palmisano, the chairman and CEO of IBM, and Wayne Clough, the president of the Georgia Institute of Technology, the initiative was guided by a Principals Committee of 17 other CEO's and university presidents representing organizations as diverse as American Airlines, Amgen, Pepsi, GM, Morgan Stanley, Columbia University, MIT, Stanford and the University of Michigan. Engaging more than 500 leaders and experts across industry, academia, government and labor, the NII epitomizes the changing nature of 21st century innovation itself—exemplifying a dynamic process of collaboration and competition. This unprecedented group of thought leaders came together to understand the changing nature of innovation in the 21st century, and—even more important—to generate a set of actions for companies, universities, community colleges, state and local government and entrepreneurs to ensure that the U.S. stays at the leading edge of innovation. In December 2004, our work culminated at a National Innovation Summit where we released *Innovate America*, a report that lays out the challenges we face, the opportunities that lie ahead and the path to get us there.

The Innovation Agenda has three foundational platforms or building blocks —Talent, Investment and Infrastructure. Each platform has three primary objectives and specific recommendations and collectively these recommendations constitute an integrated sustainable path for 21st Century prosperity. Let me just highlight one or two for each of the objectives.

Talent addresses our human capital needs. In this area we have three objectives:

1. Build the base of scientists and engineers
   - For example, by pioneering an extensive portable graduate fellowship program to give control of educational choices back to students. Attract the best and the brightest students and workers from around the world by reforming our immigration system.
2. Catalyze the next generation of innovators
   - By funding internships for innovation-oriented students to experience

local startup and small business environments, and,

3. Empower workers to succeed in the global economy
   - Ensure federal job training programs have the flexibility to target the skills needed for the jobs of the 21st century.
   - Improve the portability of healthcare and pension benefits.

The Investment area addresses the balance between risk and reward and the incentives—or disincentives—for people and institutions to invest in innovation. Our priorities here are:

1. Revitalize frontier and multidisciplinary research
   - Increase federal funding of basic research, with an emphasis on the physical sciences.
   - By reallocating 3 percent of all federal agency R&D budgets toward "Innovation Acceleration" grants that invest in novel, high-risk and exploratory research
2. Energize the entrepreneurial economy
   - Establish10 Innovation Hot Spots™ at regional locations across the United States over the next five years through public-private partnerships explicitly focused on supporting regional innovation.
3. Reinforce risk-taking and long-term investment
   - Make the R&D Tax credit permanent..
   - By setting the national goal to reduce cost of tort litigation from its current level of 2.23 percent of GDP (or $809 per person) down to 1 percent.[8] No other country bears such a large burden.

And that brings me to a core reality. Investing in innovation demands adherence to two fundamental principles: a willingness to accept risk and a willingness to wait for the return on investment. Although America's entrepreneurial economy understands and embraces these principles, the much larger financial mainstream may be now moving in the opposite direction. Investment time horizons are getting shorter. Long-term innovation strategies remain undervalued. And business executives in publicly held companies now face a regulatory climate that is blurring the line between business risk and legal risk. Intangible assets, which represent an increasingly large percentage of the value of corporations, still don't show up on the balance sheet, reducing incentives to invest in creating more value. The challenge is transparency, disclosure and corporate governance.

The Infrastructure area covers not only the physical infrastructure that supports innovation but also to the political, regulatory and legal infrastructure that facilitates innovative behavior.

1. Create a 21st century intellectual property regime
2. Strengthen America's advanced manufacturing capacity
3. Put in place a national, coordinated innovation policy with representatives from the public and private sector.

[8] Towers Perrin, "U.S. Tort Costs 2003 Update," http://www.towersperrin.com/tillinghast/publications/reports/2003.

The National Innovation Agenda is quite broad, covering the range of elements that makes up the innovation ecosystem. This point is worth emphasizing as Congress considers the President's recently announced American Competitiveness Initiative and related congressional proposals that would implement various parts of the innovation agenda.

The Administration's competitiveness initiative endorses the critical idea that innovation is an ecosystem requiring a highly-skilled workforce, investment in long-term basic research, and an infrastructure to glean value from the knowledge and new ideas we create.

The evolution of China, India and other countries as legitimate competitors on the world stage has changed the global economic dynamic for good. We cannot look back as a nation and seek to recapture the jobs or industries of the past. We must look forward to create new ideas, new technologies and new jobs that will drive America's future prosperity.

**The Path Forward**

Not resting on our laurels, the National Innovation Initiative continues to evolve and with the tremendous support of many of our members we are moving forward with the next generation of programs to build upon the findings and recommendations of *Innovate America*. Initiatives around the future of manufacturing, a national high performance computational infrastructure, regional innovation, energy and sustainability in the 21st century, and innovation metrics are being developed as we map out tipping points facing our nation and the actions needed to bolster long-term prosperity in America.

This effort is being led by a Leadership Council of many of the business and academic leaders that contributed to the NII, but also includes several new CEOs, university presidents and labor leaders.

Craig Barrett, the Chairman of Intel, and Bill Brody, the President of Johns Hopkins, are leading this initiative and it was under their stewardship that 140 CEOs, governors, university presidents and luminaries signed their name to the campaign that ran in the Wall Street Journal and Washington Post earlier this week calling for a national innovation agenda.

Going forward, we will follow-up on what we call the NII "over the horizon" initiatives. It is important that we work to extend this agenda at home, in new regions and across the globe in order to maximize the potential for collaborative efforts and the benefits of innovation to our economy.

**21st Century Manufacturing**

New value creation is the goal of the innovation continuum.

We are on the cusp of a technological renaissance in advanced manufacturing with the emergence of desktop fabrication, touch-sense-feel process controls, T-to-T, production slicing, nanoscale manipulation of matter and the acceleration and transformation of product development through high performance computing tools that will radically change the move from mass production to mass customization and by the acceleration of product design and realization into the hands of entrepreneurs and small businesses.

The NII report warned that the nation has been too quick to write-off manufacturing with the 4Ds: dirty, dumb, dangerous—and disappearing. Or to try to save 20$^{th}$ century mass production from global competition.

Indeed, in emerging areas like nano and biotechnologies, we should be balancing our leadership in cutting-edge science with leadership in cutting-edge manufacturing (like the Japanese, Germans, and increasingly, the Chinese). In fact, Japan has been repatriating its most advanced manufacturing.

We are also in the midst of a process revolution that will require a completely new set of skills and strategies. Governor John Engler, the President of the National Association of Manufacturers and Mike Burns, the CEO of Dana Corporation along with a number of their colleagues on the Leadership Council will undertake an effort to better understand this phenomenon and make recommendations to ensure America's future manufacturing capacity.

A critical part of this initiative is the power of High Performance Computing to keep alive the manufacturing renaissance.

In today's competitive global market, HPC has become essential to accelerating innovation. HPC assists companies in creating new inventions and products; in designing better, more reliable products, processes and services; in minimizing the time to build engineering prototypes; and in streamlining production processes and reducing production costs.

One of America's greatest comparative advantages is our global leadership in HPC. The Council has a major HPC initiative led by Karen Holbrook, the President of The Ohio State University, and David Shaw, of D.E. Shaw & Co., Inc., to study how HPC is, or is not, utilized by the private sector and what role public/private partnerships can play in facilitating that use.

**Energy**

A 21$^{st}$ century energy infrastructure is one of the linchpins of America's ability to compete in the global economy. The tight linkage between energy and the economy is not a new concept; every president since Nixon has made energy independence, efficiency and diversification a national priority. What is new is that geo-strategic, geo-economic and bottom line interests are converging with technological opportunity -- creating a tipping point for action.

At the same time, the technological options for energy efficiency and fuel and feedstock diversification create significant opportunities to effect real change in the marketplace. At the federal level, the National Energy Plan lays out the urgency to develop reliable and affordable energy supplies. For the first time, perhaps, America's major energy providers are investing hundreds of billions of dollars in alternative energy sources while leading corporations are proving the business case for sustainability.

The nation can rise to the global energy challenge by applying both its capacity for innovation and it ability to forge public-private partnerships that share ideas, talent and investments. Never has it been so critical to create innovative energy solutions that will sustain both our global economic leadership and domestic prosperity. This year the Council will launch an initiative to create a private sector energy roadmap – grounding the nation's investment and policy priorities in the business case for sustainability, diversification and energy efficiency.

**Regional Innovation**

The United States is not an innovative country -- it is an agglomeration of innovative, and non-innovative, regions. Our national innovation output is hindered by the many regions have not successfully implemented innovation-based growth strategies. As the *Innovate America* report argues, for America to prosper, we must help all our regions reach their full potential to support innovative firms and organizations.

The good news is that most US regions have embraced innovation as the key driver of economic growth. They are benchmarking their vulnerabilities and strengths, addressing challenges and building from a position of strength. Many have created leadership networks and identified private sector champions to lead community efforts to re-position the region for future success. Some have embraced the concept of regionalism, refusing to be hamstrung by invisible jurisdictional and institutional boundaries.

The Council on Competitiveness is undertaking two core sets of activities as part of a Regional Hot Spots Initiative: policy and technical assistance and innovation tool development.

The Council is working under a grant from the Department of Labor to assist with the rollout and implementation of the Workforce Innovation in Regional Economic Development WIRED program, a path-breaking effort to trigger "innovation hotspots" consistent with the type of public sector innovation called for in the NII and our regional innovation efforts.

In parallel, the Council will design new programs and tools to assist regions as they work to become innovation hot spots. The Council will explore three groundbreaking areas for innovation tool development:

- Better linking business people and community entrepreneurs to local universities and research centers to improve the commercialization of innovation
- Leveraging national supercomputing assets to provide support to regional firms economic development efforts
- Integrating product design principles into regional firms' competitive strategies

**Conclusion**

Government plays critical roles in enhancing and supporting the competitiveness of American businesses starting with ensuring there is an innovation friendly climate for U.S. enterprises to develop and compete at home and abroad. Today, more than ever before, the government must invest in the long term vitality of our greatest asset, the American people. We must ensure that our children are equipped with the knowledge and problem solving skills through better math, science education that will allow them to reach their full potential as high performing entrepreneurs. Another Council member once commented that "We need artists who can think like engineers, and engineers who can think like artists." These are the small and medium sized business leaders that will drive America's economic growth in the future if government makes the investments in their future now.

Government must accelerate its long standing commitment to invest in research and development at the frontiers of knowledge and ensure that America's universities and colleges remain preeminent in the world. Finally, the government must look for avenues to support the development of an advanced manufacturing capability in the United States that will position us to take full advantage of the investments in research and human capital. At one of our recent meetings, Roger Enrico, former CEO of PepsiCo and now CEO of Dreamworks Animation, talked about the importance of making big changes to big things. Change and progress, he explained, will never come if you don't free yourself from the tyranny of incrementalism. Dramatic results do not come from undramatic action. Innovation is a race with no beginning and no end. Let's get started.

Chairman TOM DAVIS. David, welcome back.

## STATEMENT OF DAVE McCURDY

Mr. MCCURDY. Thank you, Mr. Chairman. I want to specifically thank you for your leadership. It feels like old home week when I come to testify before you and Darrell Issa. I don't know of two Members of the House that have more experience in high technology and bring business acumen to this process and only wish half the other Members had as much experience and your dedication to technology.

I know time is short. I guess I am the cleanup batter here, so I am not going to take the whole bucket of balls here. I just ask that my statement can be admitted into the record.

Chairman TOM DAVIS. Without objection.

Mr. MCCURDY. I would like to just make a couple of quick points. As you know, EIA has been deeply involved in the issue of innovation. As a matter of fact, since we do represent such a wide range of the technology in this country and high tech, we frame all of our initiatives within the context of innovation and global competitiveness because that is where our industries succeed. We have a foundation.

You know, everyone talks about math and science education. In 1981, actually my first legislative victory and disappointment was to have an amendment attached to the Higher Education Act. Carl Perkins was the Chair, and it became authorized to provide scholarships to math and science teachers and summer internship programs with industry in order to supplement their income and provide some real-world experience. Unfortunately, in this place, you not only have to worry about authorization, you have to get the appropriations, and it was not appropriated, and I think we have missed some opportunities.

So as much as we have this momentum, and I think there is good momentum for innovation in the innovation agenda, we have to be very diligent and continue to keep an eye on where this actually ends up.

Our foundation at EIA called NSTEP, National Science Technology Education Partnership, has been working; and Darrell Issa has contributed and others not only financially but to provide mentorship for young Americans to understand math and science and how it affects them in their daily lives.

TIA, our communications sector, has an incredible research division. Meredith Singer is here, and they have a CTO Council which has provided in incredible detail about the decline of research and development in the communication side and where we need to provide some emphasis.

Last, I just want to mention just a quick commercial. Over 2½ years ago, we published this document based on a prosperity game that we played with CEOs and academics and industry leaders and members of government that came up with a series of 40 recommendations to improve innovation; and even though I am an absolute passionate advocate of innovation, I think we have to be very, very careful about our rhetoric and the hyperbole.

I think most of us agree—and Deborah and I have worked on this issue a long, long time. She has provided incredible leadership.

But we are really not at a crisis yet. We are really at a crossroads, and I think now is the time for the leadership of our country to step up and say we do have some tough choices to make. We need to make the investments now.

That is why I agree with everyone that has appeared before this panel today, the Secretary of Commerce and my association colleagues, when we say that the Secretary is right, the President was right. We are pleased that he raised the level of attention in this State of the Union for innovation.

But there is a very important movement here on the Hill, in the Senate. We see extremely strong leadership with Senator Ensign and Senator Lieberman with their bill.

After the Augustine report, we see very broad-based legislation from Senators Alexander and Bingaman and others, with over 60 cosponsors in the Senate, bipartisan. I know the Democratic leadership in the House has advocated an innovation agenda, and I understand that the Speaker and Mr. Goodlatte will be unveiling the Republican leadership proposal on innovation perhaps today.

My only hope is that from past experience and one who admires this Institution is that we do our best to make this a bipartisan effort. This should not be a partisan issue.

Quickly, in just one quick insertion on a thought, as much as we want this legislation to pass and the budgets can be an improvement and we want to see the prioritization and the emphasis, I would certainly urge your leadership in strong support for reducing the number of congressional earmarks when it comes to research and development in science, which I think really does hamper the ability to have an effective U.S. leadership.

I mentioned R&D. We all support making permanent the R&D tax credit. It is costly. But I think it is one of the best investments we as a Nation can make. I will mention again there are a number of very good proposals not only with the President's outline but also in these key bills.

But I want to give one example of an area when it comes to business climate, and this is the one point I will finish with. That is innovation, and the key to innovation is having IT diffused throughout the economy. That is why we have an advantage over other countries. But they are reading our blueprints on our success, and they are going to try to copy it.

They have had these—Europe has their six framework, China has a 5-year plan, Japan had a 5-year plan. They all have these plans, and the United States is yet to really step forward with a clear vision for innovation, and that is why we encourage you to provide leadership on.

But the one area, an example, is from the semiconductor space, and Dr. Ruiz talked about the need for competition.

But it is a simple fact that when the cost of a new fab production capability for semiconductors costs $1 billion more in the United States to build and operate than it does in China, Israel, Ireland, parts of Asia—two-thirds of the No. 30 millimeter fabs are being built in Asia—but when there is such a discrepancy in the cost, it is no longer a question of are you protecting American jobs or are you a patriot—and we heard those arguments, those fallacious arguments in the past about the Benedict Arnold CEOs. That is wrong. That is not the case. They are real business decisions when you are talking about that kind of investment and that kind of change. So those differentials are important.

I know this is not the Ways and Means Committee, but I do think we need to look at some of the proposals of where these incentives are being laid out, why the United States has a 35 percent corporate tax rate and in Ireland it is 12.5 percent. China provides a fab 5-year tax holiday and then, after that holiday, half the normal rate of taxes for the next 5 years. Israel has a 20 percent capital grant. A new fab going up in Israel.

An example I heard the other day, a real-life example, the State of Arizona is having a new fab built in the State that provided up to $20 million in incentives. It is good. It is positive. Same plant in Israel has a $700 million set of incentives. So, at some point, the shareholders themselves start to say, how can you disregard the economics? So I think there is a very important point.

And, last, we don't want to forget about small business. They live and the startups live and die by the sword of innovation, and we shouldn't just ignore their capabilities as well.

Mr. Chairman, thank you; and I will be glad to answer any questions.

Chairman TOM DAVIS. Thank you very much.

[The prepared statement of Mr. McCurdy follows:]

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**TESTIMONY OF ELECTRONIC INDUSTRIES ALLIANCE PRESIDENT AND CHIEF EXECUTIVE OFFICER DAVE McCURDY BEFORE THE HOUSE GOVERNMENT REFORM COMMITTEE ON GLOBAL COMPETITIVENESS & INNOVATION**
**February 9, 2006**

Thank you, Mr. Chairman, Ranking Member Waxman and Members of the Committee. I am appearing today as the President and CEO of the Electronic Industries Alliance (EIA). EIA is grateful for the opportunity to appear before you today to discuss the issues of global competitiveness and innovation, and what the federal government can do to improve the business and job creation climates in the U.S.

EIA's Focus on Global Competitiveness and Innovation

As one of oldest, largest high-tech trade associations representing the full spectrum of the electronics industry, EIA frames its policy priorities in the context of innovation & global competitiveness.

The best hope for the U.S. to maintain its edge against rising global competition is by fostering and expanding our most prized intellectual asset: innovation. For decades, innovation has given the U.S. and the rest of the world wave after wave of technological advancement and generated millions of jobs, economies of scale and direction for future growth. If we want to ensure that successive waves of innovation begin in the U.S., we have to have the necessary innovation infrastructure in place.

I commend President Bush for raising innovation in his State of the Union Address and budget. I also want to note the bipartisan leadership in the leading Senate measures and encourage the House to develop and advance bipartisan approaches to this critical measure. The House Democratic leadership has made an encouraging start with its recent Innovation Agenda, and we hope these efforts will bear bipartisan fruit.

EIA realizes that making innovation and global competitiveness a policy priority is no easy task when other important domestic and international issues are at stake for Congress and the Administration. Nonetheless, the call for a national innovation vision and strategy is no less compelling today than it was when we began our work three years ago, and we deeply appreciate the interest this Committee has shown in examining these concerns.

As a passionate advocate of innovation, I am careful, however, not to hype or overstate the challenge we face. In my opinion, we are not in "a crisis." As the title of our 2004 policy playbook, *The Technology Industry at an Innovation Crossroads* (to download, go to www.eia.org/playbook.) indicates, we believe America is at an important national juncture. Currently, the U.S. is far ahead of the foreign competition in our national ecosystem that supports innovation and creativity. It is an enormous advantage that has created vast economic growth and prosperity for our nation. However, other nations have read the blueprints of America's success and are attempting to duplicate our model. Accordingly, we cannot and should not rest on our laurels. It is absolutely imperative that we continue to renew the innovation pipeline and infrastructure to remain the preeminent leader of technology development.

EIA's Policy Efforts: Policy Playbook and Engaging Policymakers

EIA has been examining the significant structural changes taking place in the world economy and in the high-tech industry in particular for some time. Over the past three years, the Alliance has devoted its resources to promoting a bipartisan national vision and strategy on innovation and global competitiveness.

In January, 2004 at EIA's Executive Leadership Forum and Board of Governors Meeting, we held a unique exercise known as Prosperity Games™ -- essentially war games for the business world – that brought together members of our board, legislators, Administration staff, industry experts and thought leaders for two days and emerged with the outline for *The Technology Industry at an Innovation Crossroads.* Published in the spring of 2004 with 40 specific recommendations, the playbook has been endorsed by Members of Congress and thought leaders on both sides of the aisle.

EIA's policy playbook addresses many of the issues that have grown in prominence and been echoed by our colleagues throughout the technology and business community, including those in the recent policy report developed by Norm Augustine and the National Academies of Sciences (NAS) entitled "Rising Above the Gathering Storm."

Since 2002, EIA has also met with numerous competitiveness proponents in the House and Senate as well as key Bush Administration officials, including Dr. John Marburger. We appreciate Dr. Marburger's leadership as head of the White House's Office of Science and Technology Policy. In addition, for the past decade, the National Science and Technology Education Partnership or NSTEP, EIA's philanthropic partner, has focused on the need to strengthen science, technology, engineering and mathematics curriculum known as STEM so that the U.S. high-tech industry has a workforce geared to the future demands of a global innovation economy.

These issues are important to me personally as well. In fact, my first legislative achievement – and disappointment -- in the House was having an amendment added to the Higher Education Act for Math & Science Teacher scholarships and providing summer jobs in industry. The fact that the program was never appropriated should serve as a cautionary note for all of us who are trying to balance the realization of important policy goals with the fiscal realities of budget demands.

EIA also participated in the National Innovation Initiative led by my friend Deborah Wince-Smith, also testifying here today, and we are working to advance positive, bipartisan legislation such the National Innovation Act (S. 2109), introduced by Senators John Ensign and Joe Lieberman in December, and the three bills prompted by the NAS "Gathering Storm" report that make up the Protecting America's Competitive Edge (PACE) legislation introduced last month by Senators Lamar Alexander, Jeff Bingaman, Pete Domenici and Barbara Mikulski.

EIA's sector partner, the Telecommunications Industry Association (TIA), is also providing policy leadership on the issues of innovation and competitiveness. Through its

Communications Research Division, whose efforts are led by the president of research for Telcordia Technologies and the chief technology officer for Bechtel Telecommunications, TIA's chief technology officers are working to ensure that the U.S. communications sector continues to be a world leader in advanced research. TIA is also providing expert advice to the government on the status and impact of research and technology to the communications industry and educating the public on the importance of communications research as a foundation for the communications products and services on which they depend.

We have met repeatedly with the Administration over the years and earlier this year, I wrote to President Bush on behalf of the Alliance and urged him to promote U.S. competitiveness as a national policy goal in this year's State of the Union Address and to "make 2006 the year of innovation." We are heartened that the President devoted part of his address to innovation-related issues such as basic research, math and science education and a skilled workforce. In fact, many of the approaches the President is urging the U.S. to adopt as part of his American Competitiveness Initiative reflect EIA's past recommendations. EIA has therefore publicly pledged our support for the President's American Competitiveness Initiative, as well as for the welcome focus on these areas that a number of Members of Congress have initiated. We are also cognizant of the fact that the myriad goals and recommendations established in these critical policy areas will be costly to realize, and we welcome the critical debates and prioritizing that must occur as we move forward.

Proposals to Improve U.S. Environment for Competitiveness and Innovation

Improving the landscape for high-tech companies doing business in the U.S. and employing American workers can be accomplished in a number of ways. We can provide an incentive for research and development by modernizing the R&D tax credit and finally making it permanent, as the President and others have recommended. The federal government has a crucial role to play in fostering research at the most basic and experimental level, and our technology industry must invest in the later-stage research and in development to bring consumers the next generation of innovative products. R&D

involves great risk and great expense for an uncertain outcome, and companies must have reasonable incentives in place in the U.S. to mitigate that risk. The expiration of the credit at the end of 2005 meant as much as a 7.5% increase in the cost of doing qualifying R&D in the U.S. for many companies, potentially leading to a shift in R&D to other countries with more generous tax incentives. Those R&D centers tend to leave and not return home. The credit's lapse, even if it's just for a short time, leads to uncertainty regarding the availability of the credit, leaving companies unable to plan and causing them to discount its long-term value, which reduces the credit's benefit to the economy. R&D planning requires a long-term view, but short-term extensions and lapses dramatically dilute the incentive. A strengthened R&D credit will provide companies with a strong reason to undertake and increase domestic research work, and we endorse the President's idea to modernize the credit, in addition to making it permanent. We also thank Committee Members Shays, LaTourette, Souder, Cannon, Miller, Issa, Westmoreland, McHenry, Dent, Foxx, Lantos, and Higgins for their co-sponsorship of legislation (HR 1736) calling for a permanent and enhanced credit.

The President's American Competitiveness Initiative includes a series of education initiatives such as the Advanced Placement/International Baccalaureate (AP/IB) Program; the Adjunct Teacher Corps; the National Math Panel; Math Now for Elementary and Middle School Students; Evaluation of Federal STEM education programs; the inclusion of Science Assessments in No Child Left Behind accountability; and grants to local educational agencies to increase the achievement of high school students. These initiatives are worthwhile proposals that deserve the consideration and attention of industry and policymakers alike.

As part of his American Competitiveness Initiative, the President also calls for Career Advancement Accounts of up to $3,000 available to for workers entering the workforce or transitioning between jobs. We find this proposal encouraging in that it helps to create a system of continual skills training and worker education as also outlined in our policy playbook; in the past, EIA has proposed the availability of wage insurance for high-tech workers who enter the teaching profession.

The U.S. must also be a place that continues to attract the foreign talent that has always helped imagine, create and perfect America's innovative products and services. Bright students and skilled professionals from around the globe see the U.S. as the place to make the most of their talents and as a nation that recognizes and rewards unique abilities and hard work. While we must foster the skills and talents of our own citizens, as well, we cannot afford to turn away the best and brightest from all corners of the world. By facilitating expedited visa processing, as recently outlined by Secretary of State Rice and Homeland Security Secretary Chertoff, and by ensuring a reasonable balance between security and our historical acceptance of foreign talent, the U.S. can continue to lead.

We should also devote attention and resources to improving the U.S. business landscape, including the tax burdens for companies trying to innovate and create jobs here. Let me give you one example: It costs $1 billion more to build and operate a semiconductor factory in the U.S. than it does outside our borders, and the biggest factor – about 70% of that $1 billion difference – is taxes. Two-thirds of new 300mm fabs under construction, equipping, or in production are in Asia. Why? Because China offers a five-year tax holiday for a new fab and then a 50% rate cut for another five years. China's business-friendly approach was prompted in part because Malaysia offers a 10-year tax holiday. The use of these types of business recruitment tools is not limited to countries in the Far East. Israel recently offered a leading high-tech company a $700 million tax credit to build a fab there. It would be wise for the U.S. to consider adopting approaches similar to these nations.

Along these lines, Members should also be aware that the ability of states to offer incentives for businesses to locate production is called into question in the *Cuno vs. Daimler-Chrysler* case, which will be argued before the Supreme Court in March. Such state actions are an important element in the competitiveness equation, and the Congress should act to protect this state right, if it is struck down. Some of the options we need to consider to attract highly productive investments in the U.S. include a meaningful corporate tax rate reduction, full expensing of a factory in year one, or an investment tax credit.

Small Business Innovation Needs

Recently, the CEO of one of EIA's member companies outlined the challenges faced by smaller, start-up high-tech businesses operating in the global economy. He noted that we often speak on issues of immigration, visas, employment outsourcing, and technology innovation. Politicians, he observed, often use them as hot button issues, while others discuss them as and independent silos within the current public discourse, unaffected by each other. However in his world of start-ups, these issues are closely intertwined. "Start-ups live by the 'sword' of innovation," he said. They rely on technical innovations to attract the critical first-round of investors, favorable immigration and visa policies to refine their technological achievements by attracting the best talent to work in the U.S. in a cost-effective manner, and business opportunities in other markets to help their startup survive, let alone expand, in an incredibly competitive environment.

He is concerned that the U.S. is not doing enough to encourage innovation and suggested that America must foster a business environment that rewards entrepreneurs. He is not suggesting government intervention. Instead, he proposes partnerships between business and government such as those recently initiated in Canada and Israel, and partnerships between small businesses and large corporations.

These are interesting comments that I think this committee would do well to take into consideration.

Concluding Remarks

EIA has been calling for a shared commitment in the effort to create a national technology vision and strategy that can bolster U.S. competitiveness by nurturing and expanding our innovation economy for some time. With that in mind, I would like to emphasize that all the components of an innovation agenda – a commitment to R&D, an improved, STEM-oriented education system, continuous worker training expedited visa reform and an environment more conducive to doing business in the U.S. – should be considered together, not each in its own vacuum.

With the President's American Competitiveness Initiative, the Administration has added its significant voice to this call. We commend President Bush and the bipartisan leadership shown by members of the Senate and encourage members of the House to continue working to craft similar innovation efforts.

The President's American Competitiveness Initiative, coupled with Senate action, growing interest and anticipated legislation in the House, and efforts by EIA, TIA and our other sector partners, the Council on Competitiveness, the National Innovation Initiative, the National Academy of Sciences and a host of others, suggests that we are on the cusp of improving the nation's future competitiveness. We welcome the opportunity to provide the leadership and expertise of the U.S. high-tech industry in realizing these goals.

I am grateful to Chairman Davis and to this Committee for the interest you have shown in examining these concerns, and I welcome your questions and comments. Thank you.

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Chairman TOM DAVIS. Let me just start. You ended your comments on small business. Sometimes the only way a small business can get into the marketplace is with a congressional earmark.

I just met with a company yesterday out of Syracuse, NY, that is doing work on IEDs. They have a breakthrough technology that we think has proven far more effective. They couldn't go through the Defense Department and get any kind of traction, so they had to go through the Appropriations Committee who brought them to front.

The difficulty with earmarks is there are good ones and bad ones. Many times we use the earmark process for a full employment process for Members' districts, and that is not good. On the other hand, we have a responsibility to kind of bring new technologies to the fore that if they work their way through the established chains in the bureaucracy get shut down. So I don't know what the right balance is. But I would hate to throw the baby out with the bath water when we talk about Congress' ability to intervene. It helps when some of these emerging technologies that may not be able to get their way through the minimal process.

Mr. MCCURDY. Mr. Chairman, can I make one quick comment on that?

I agree there are many times—I was on the R&D Subcommittee of the Armed Services. I was on the Science and Space Committee. I chaired the Intelligence Committee. It is important for Congress to raise the level of awareness on many types of technology, but I do hope that we can work with—something is wrong when the Department of Defense and these other agencies are not recognizing that their acquisition policies are biased against some of these new capabilities. In fact, we also are constantly talking to some of our large multinational corporations to don't forget the R&D and some of the real innovation that is coming out of the small business.

Chairman TOM DAVIS. Absolutely, and any time we do the Trade Agreements Act and Buy America, it cuts down our ability to get out there. Yet there is a strong urging with some Members that we ought to be buying America, not recognizing that when we do that other countries set up barriers in retaliation; and, No. 2, that means we may not get the best body armor for our troops if it is not American made, if we don't do the best in everything in this day and world, and our taxpayers deserve to get the best product for their tax dollars. I agree.

I want to go to this idea of innovative friendly climate, because there has been a thread throughout the testimony today in both panels that America is still the innovators, that they can produce the scientists and engineers abroad, but we are the innovators because we have a political culture and economic culture that is different from other countries, and I guess to some extent that is true.

But Mr. Garnick, let me start with you. Other countries—although we have had 200 years in the free enterprise experience and in the democratic experience and some of these other countries are getting it in a kind of hopscotch fashion, just because we have been successful as innovators doesn't mean that we will stay that way. Can you talk a little bit about your experience as you go around the globe with that?

Mr. GARNICK. Sure. I don't think it is an entitlement that we dominate the innovation and continue the self-fulfilling prophecy that we will always dominate it. I think it comes down to economics and an environment where it is a game of numbers.

In India, for example, it is recognized clearly they have made tremendous progress since they opened up their economy in only 1991. It has only been 16 years since they really started liberalizing their economy. The rate of change of their infrastructure is so fast and with so much investment and resources available, just human resources, that they are capable of I think over the next couple decades of displacing or at least inhibiting our career leadership in that area.

Is that a bad thing for America? I don't think it is necessarily a bad thing. It is just a changed environment that we need to deal with.

Competition, as Dr. Ruiz said, is critical to continue to raise the bar for our own economy and our own companies serving that economy. However, it should be recognized that these countries recognize that innovation is critical. They have created an environment where they are extremely bright, motivated individuals that aspire not to be viewed as back-office engineers just doing coding or body shopping as often relayed or doing just work that is redundant and repeatable, that is digitized and moved over. The workforce is motivated to changing their environment and changing their environment in such a way that they are reading our blueprint. That again is something we should be proud about but recognize the reality that is what we are facing.

You know my own old organization, we had an organization of 45,000 people that worked for me. We had the ability to dedicate over 1,000 engineers almost to the innovation segment of the business that in my current company, with 10,000 employees and a different economic model, I am not capable of matching that 1,000 people head count in innovation. Over time, that will inhibit or create a different economic value proposition.

The company I was with in the past is about a $2 billion company on a trajectory of rapid growth. Today, this current company I am with, Keane, is a $1 billion company. We are accelerating the growth, but our ability to invest, because of the economic platform that is in front of us, is different. We have to think through different ways of solving the problem; and it is both technological, it is business model, and it is economic. But we will get there. But I think we have to recognize that we do not own a patent on innovation in the world.

Chairman TOM DAVIS. Anyone else want to comment?

Ms. Wince-Smith, I like your comment about artists thinking like engineers and engineers thinking like artists, because that is really what innovation is, as opposed to just the drudgery of performing the work. Our tax system, to some extent, as we see from some of the testimony is not helpful in this area. We have a Tax Code that was designed for a different time in a different era. In the chip business we are seeing the chip business in America just migrating over to Korea and to Japan and other areas. And if China will ever get their intellectual property rights together, the chip business, they dominate that and we see us losing in those areas as well.